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Lay and Mitchell Lakes, Chilton and Coosa Counties, Alabama

Environmental Monitoring and Support Lab, Las Vegas, Nev

Prepared for

Alabama Water Improvement Commission, Montgomery

Jul 76

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NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

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Report

on

Lay and Mitchell Lakes
Chilton and Coosa Counties
Alabama

EPA Region IV

Working Paper No. 230

With the cooperation of the

Alabama Water Improvement Commission

and the

Alabama National Guard

July 1976

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGEMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Alabama Water Improvement Commission for professional involvement and to the Alabama National Guard for conducting the tributary sampling phase of the Survey.

E. John Williford, Chief, Surveillance and Monitoring Section; and John C. Chitwood, Biologist, Surveillance and Monitoring Section; and Sam L. Coleman, Water Quality Planning Section; and M. H. Floyd, Engineer, Surveillance and Monitoring Section; and Truman Green, Engineer, Municipal Waste Control Section; and Tim McCartha, Biologist, Surveillance and Monitoring Section; and James E. McIndoe, Engineer, Water Quality Planning Section; and Richard T. Maddox, Engineer, Industrial Waste Control Section; and James T. White, Engineer, Municipal Waste Control Section provided invaluable lake documentation and counsel during the course of the Survey.

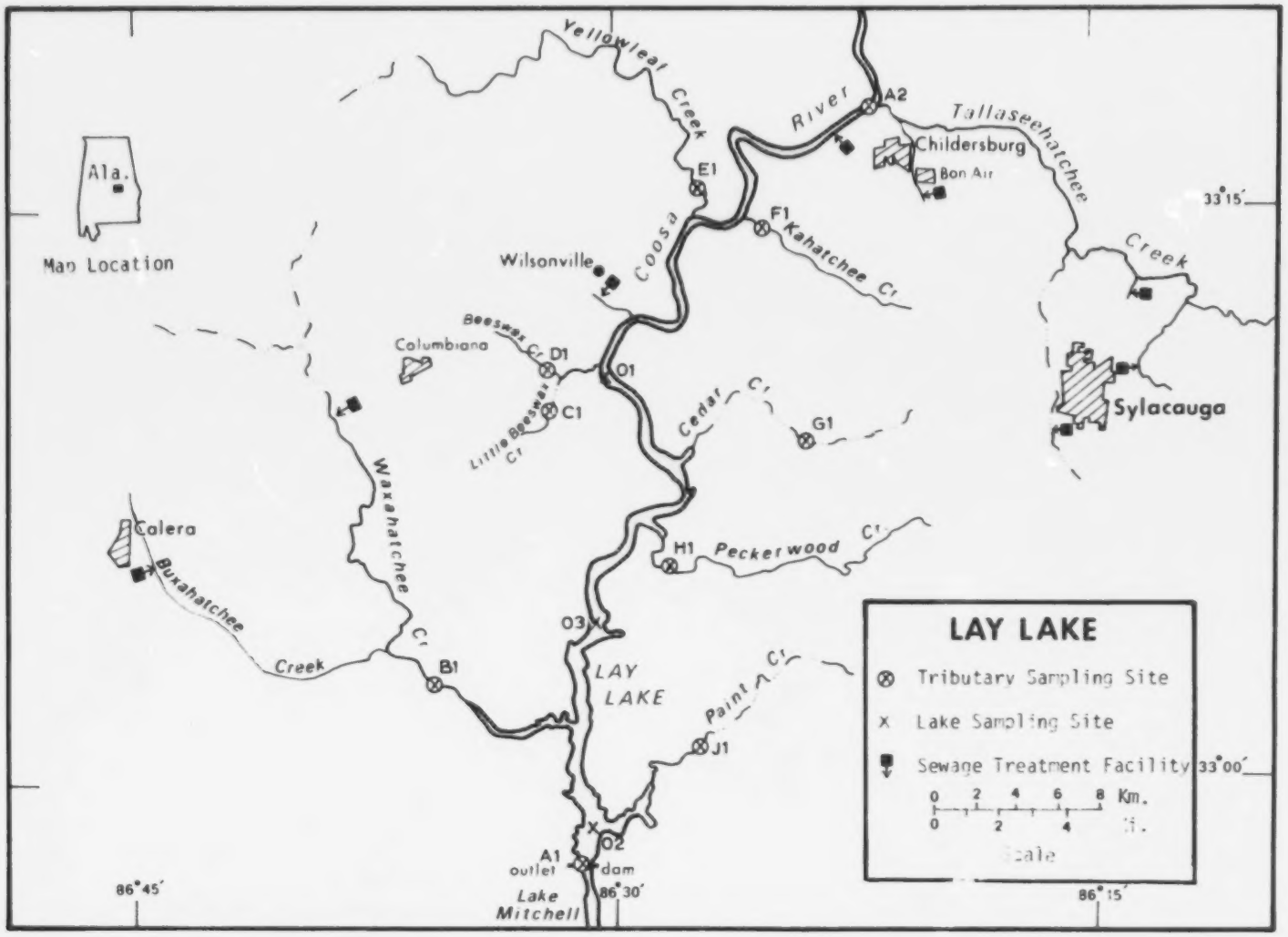
Major General Charles A. Rollo, Adjutant General of Alabama, and Project Officer Lt. Col. Wash B. Ray, who directed the volunteer efforts of the Alabama National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

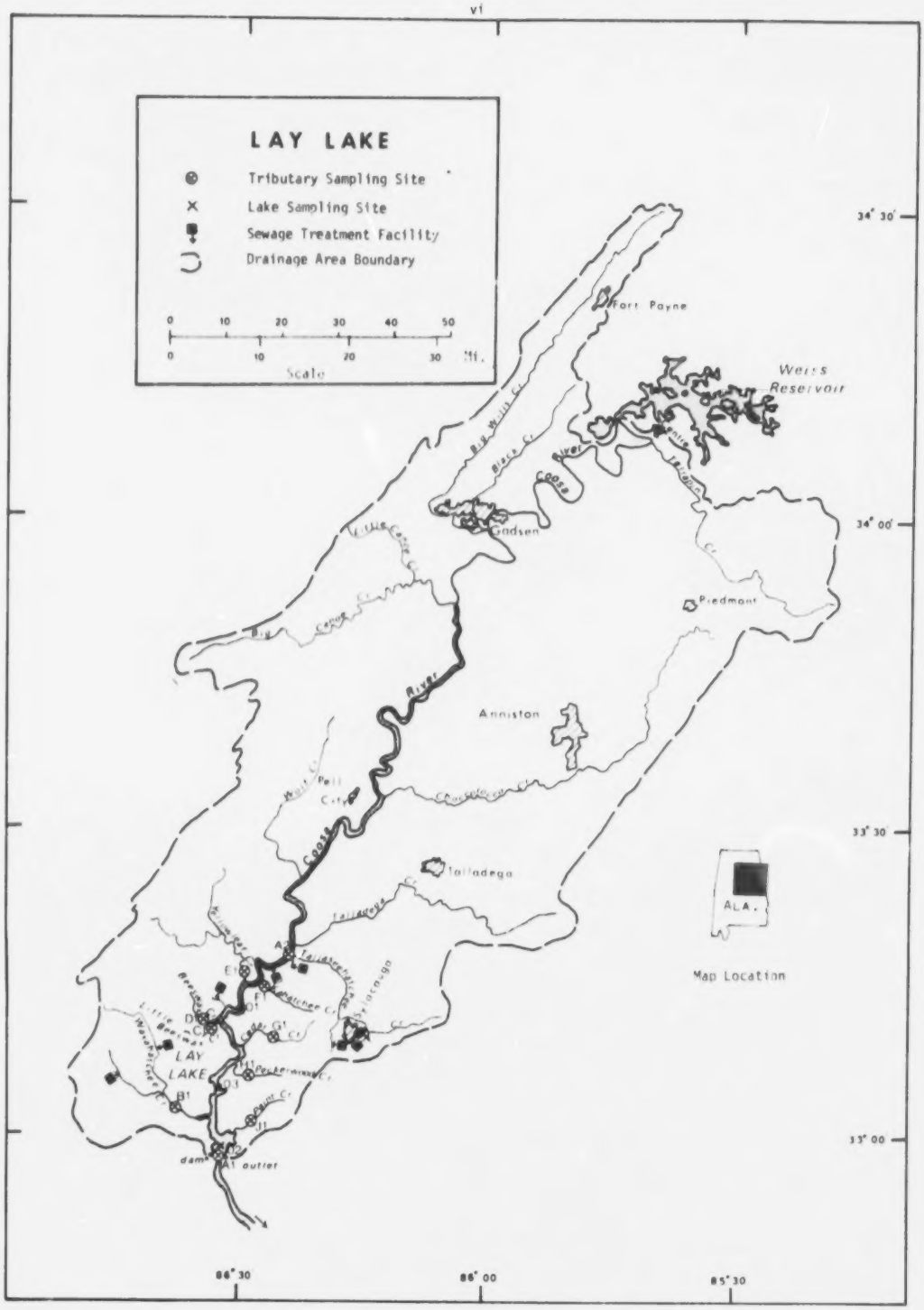
STUDY LAKES

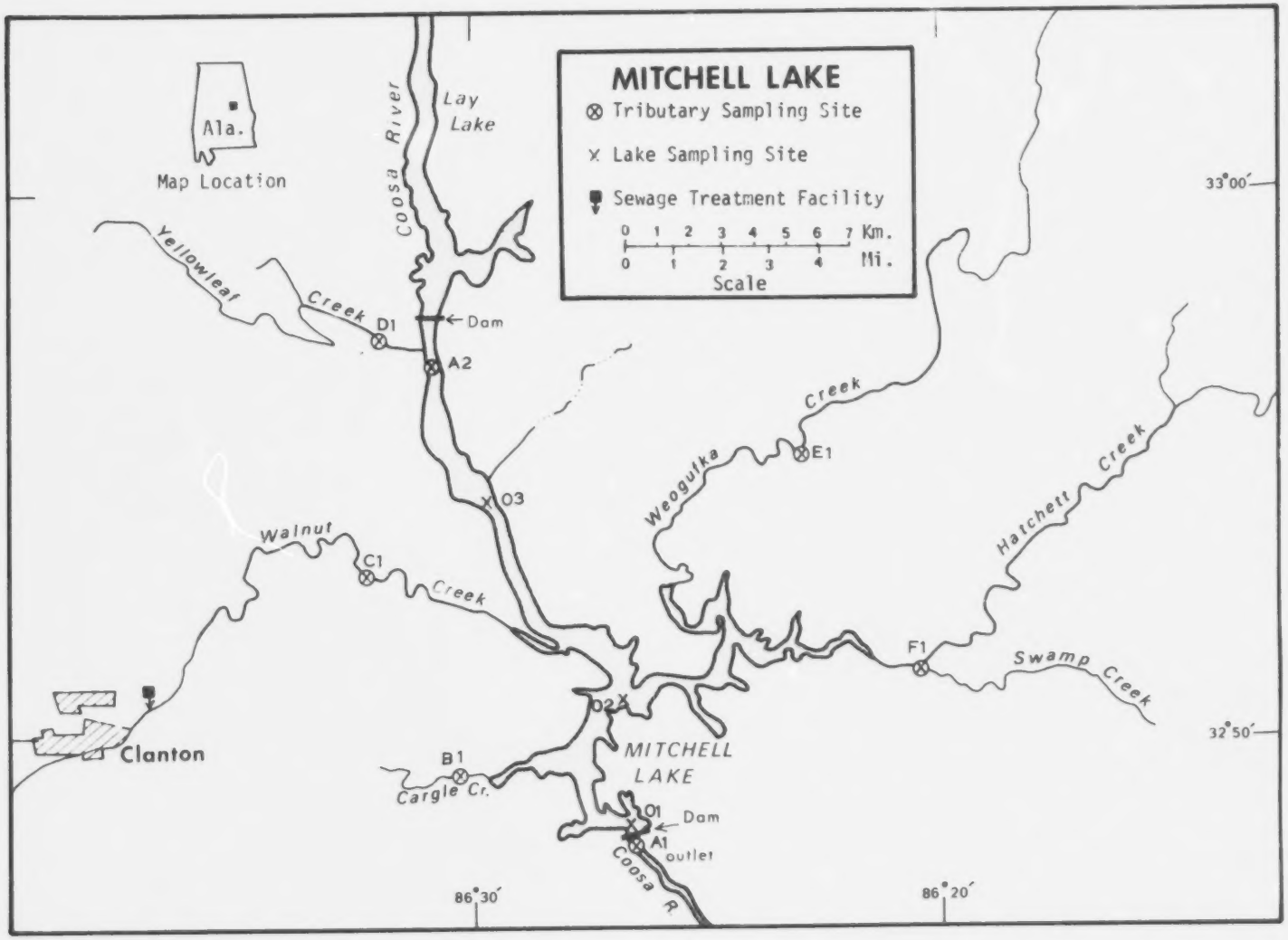
STATE OF ALABAMA

LAKE NAME	COUNTY
Bankhead	Walker
Gantt	Covington
Guntersville	Marshall, Johnson
Holt Lock and Dam	Tuscaloosa
Lay	Chilton, Coosa
Martin	Elmore, Tallapoosa
Mitchell	Coosa, Chilton
Pickwick	Colbert, Lauderdale (Tishomingo in MS and Hardin in TN)
Purdy	Jefferson, Shelby
Weiss	Cherokee
Wilson	Lauderdale, Colbert, Lawrence



LAY LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 2 4 6 8 Km.
0 2 4
Scale
Ala.
Map Location
Yellowleaf Creek
Coosa River
Tallaseehatchee Creek
Childersburg
Bon Air
Sylacauga
Wilsonville
Columbiana
Beeswax Cr
Little Beeswax Cr
Kahatchee Cr
Cedar Cr
Peckerwood Cr
Paint Cr
Waxahatchee Cr
Buxahatchee Creek
Calera
LAY LAKE
Lake Mitchell
outlet
dam
A1
A2
B1
C1
D1
E1
F1
G1
H1
J1
O1
O2
O3
33°15′
33°00′
86°45′
86°30′
86°15′


LAY LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
0 10 20 30 40 50
0 10 20 30 Mi.
Scale
Fort Payne
Weiss Reservoir
Gadsden
Piedmont
Anniston
Talladega
ALA.
Map Location
LAY LAKE
dam
outlet
34° 30'
34° 00'
33° 30'
33° 00'
86° 30
86° 00
85° 30


MITCHELL LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 1 2 3 4 5 6 7 Km.
0 1 2 3 4 Mi.
Scale
Ala.
Map Location
Coosa River
Lay Lake
Yellowleaf Creek
D1
Dam
A2
O3
Walnut Creek
C1
Weogufka Creek
E1
Hatchett Creek
F1
Swamp Creek
O2
MITCHELL LAKE
Clanton
B1
Cargle Cr.
O1
Dam
A1
outlet
Coosa R.
33°00′
32°50′
86°30′
86°20′

REPORT ON LAY LAKE AND MITCHELL LAKE, ALABAMA

STORET NUMBERS 0106 AND 0108

I. CONCLUSIONS

A. Trophic Condition:*

Lay Lake and Mitchell Lake are classified as eutrophic, i.e., nutrient-rich and highly productive, based upon Survey data. Whether such nutrient enrichment is to be considered beneficial or deleterious is determined by its actual or potential impact upon designated beneficial water uses of each lake.

The phytoplankton was dominated by pollution-tolerant genera. Nutrient levels, potential productivity as measured by algal assay control yields and chlorophyll a values are high, while Secchi disc visibility is low. Of the 11 Alabama lakes surveyed in 1973, only one had higher median total phosphorus values than Lay Lake, and 4 had higher total phosphorus levels than Mitchell Lake.

b. Rate-Limiting Nutrient:

Algal assay results indicate that Lay and Mitchell Lakes were limited in primary production by available

*See Appendix E.

nitrogen levels. Spikes of nitrogen, and nitrogen and phosphorus simultaneously resulted in increases in assay yields. Additions of phosphorus alone did not stimulate a significant growth response. The ratios of available inorganic nitrogen to orthophosphorus (N/P) in sampled waters were generally consistent with nitrogen limitation.

C. Nutrient Controllabity:

1. Point sources -

The mean annual phosphorus load from known point sources was estimated to be 3.3% of the total directly reaching Lay Lake, and 0.5% of the total to Mitchell Lake. Nutrient loading to both reservoirs was far in excess of the eutrophic levels proposed by Vollenweider (1975) for lakes with such volumes and retention times. However, Vollenweider's model probably does not apply to lakes with short hydraulic retention times, and the retention times of Lay and Mitchell Lakes are only 14 and 1 days, respectively.

Loading calculations for both Lay Lake and Mitchell Lake indicate a net export of phosphorus, suggesting sampling was not adequate to depict actual loading and export rates. This apparent export could be attributed to undetected discharges reaching the lakes from unknown industrial or municipal sources, or to nonrepresentative sampling.

2. Nonpoint sources -

Nutrient loading appears to be largely uncontrollable for both impoundments. The Coosa River contributed over 92% of their total nutrient budgets, and ungaged drainage areas were estimated to have contributed only about 1%. Additional sampling and an evaluation of current land uses and presently unmeasured point sources are necessary before recommendations for either lake can be proposed.

In general, few lakes are nitrogen limited as a result of low nitrogen. Rather, excessive phosphorus levels shift limitations to nitrogen or other factors. Regardless of the primary nutrient limitation suggested by either algal assay or nutrient ratios, the most feasible approach to nutrient control, if desirable, is through available phosphorus control technology and subsequent establishment of phosphorus limitation within the water body.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. The surface area and mean depth were provided by the Alabama Water Improvement Commission; maximum depth was estimated on the basis of National Eutrophication Survey (NES) sampling data; tributary flow data were provided by the Alabama District Office of the U.S. Geological Survey (USGS). Mean hydraulic retention time was obtained by dividing the lake volume by mean flow of the outlet. Precipitation values are estimated by methods as outlined in NES Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

A. Lake Morphometry:

	Lay Lake	Mitchell Lake	
1. Surface area:	48.56	23.63	km^2.
2. Mean depth:	10.1	1.3	meters.
3. Maximum depth:	25.0	24.4	meters.
4. Volume:	492.884	30.719	$x\ 10^6\ m^3$.
5. Mean hydraulic retention time:	14	1	days.

B. Tributary and Outlet (see Appendix B for flow data):

1. Tributaries -

Lay Lake			Mitchell Lake		
Name	Drainage area(km^2)	Mean flow (m^3/sec)	Name	Drainage area(km^2)	Mean flow (m^3/sec)
A(2) Coosa River	21,730.1	316.79	A(2) Coosa River	23,387.7	402.29
B(1) Waxahatchee Creek	458.4	7.43	B(1) Cargle Creek	26.7	0.54
C(1) Little Beeswax Creek	24.3	0.43	C(1) Walnut Creek	113.4	2.52
D(1) Beeswax Creek	44.0	0.83	D(1) Yellowleaf Creek	204.3	3.53
E(1) Yellowleaf Creek	484.3	8.01	E(1) Weogufka Creek	287.5	3.96
F(1) Kahatchee Creek	40.1	0.72	F(1) Hatchett Creek	963.5	16.01
G(1) Cedar Creek	70.4	1.15			
H(1) Peckerwood Creek	68.6	0.89			
J(1) Paint Creek	41.4	0.50			
Minor tributaries and immediate drainage	376.2	7.09	Minor tributaries and immediate drainage	318.2	5.70
Totals	23,337.8	343.84	Totals	25,301.3	434.55

2. Outlet -

A(1) Coosa River	23,387.7	402.29	A(1) Coosa River	25,325.0	442.84

III. LAKE WATER QUALITY SUMMARY

Lay Lake and Mitchell Lake were sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from three stations on each lake and from a number of depths at each station (see maps, page v-vii). During each visit, depth-integrated samples were collected from each station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first visit, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths (in meters) sampled were as follows:

Station Number	Lay Lake	Mitchell Lake
1	7.3	22.9
2	23.8	12.8
3	11.9	11.0

For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

LAY LAKE
STORET CODE 0106

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	N*	(6/ 6/73) S*** = 3 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(8/24/73) S*** = 3 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(10/31/73) S*** = 3 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	6	25.0- 25.9	25.6	0.0- 1.5	6	29.3- 30.2	29.9	0.0- 1.5	6	20.0- 21.3	20.3	0.0- 1.5
MAX DEPTH**	3	25.0- 25.4	25.1	7.3- 22.9	3	29.3- 29.7	29.3	6.7- 22.9	3	20.0- 21.3	20.3	6.4- 23.8
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	3	5.6- 6.0	5.6	1.5- 1.5	3	4.0- 7.2	4.6	1.5- 1.5	3	5.2- 5.6	5.4	1.5- 1.5
MAX DEPTH**	3	5.0- 5.7	5.2	7.3- 22.9	3	2.0- 4.2	4.0	6.7- 22.9	3	5.2- 5.8	5.8	6.4- 23.8
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	6	105.- 130.	108.	0.0- 1.5	6	155.- 173.	171.	0.0- 1.5	6	140.- 145.	142.	0.0- 1.5
MAX DEPTH**	3	105.- 115.	105.	7.3- 22.9	3	152.- 172.	171.	6.7- 22.9	3	140.- 148.	140.	6.4- 23.8
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	6	6.9- 7.2	7.0	0.0- 1.5	6	7.2- 8.2	7.3	0.0- 1.5	6	7.2- 7.3	7.2	0.0- 1.5
MAX DEPTH**	3	6.9- 7.2	6.9	7.3- 22.9	3	7.0- 7.2	7.1	6.7- 22.9	3	7.2- 7.3	7.2	6.4- 23.8
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	6	41.- 44.	42.	0.0- 1.5	6	51.- 57.	55.	0.0- 1.5	6	46.- 51.	48.	0.0- 1.5
MAX DEPTH**	3	42.- 47.	43.	7.3- 22.9	3	50.- 55.	55.	6.7- 22.9	3	47.- 53.	48.	6.4- 23.8
TOTAL P (MG/L)												
0.-1.5 M DEPTH	6	0.074-0.091	0.084	0.0- 1.5	6	0.023-0.054	0.037	0.0- 1.5	6	0.052-0.110	0.089	0.0- 1.5
MAX DEPTH**	3	0.076-0.097	0.093	7.3- 22.9	3	0.035-0.055	0.037	6.7- 22.9	3	0.073-0.120	0.097	6.4- 23.8
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	6	0.031-0.045	0.039	0.0- 1.5	6	0.007-0.027	0.013	0.0- 1.5	6	0.021-0.067	0.053	0.0- 1.5
MAX DEPTH**	3	0.033-0.038	0.034	7.3- 22.9	3	0.011-0.021	0.018	6.7- 22.9	3	0.026-0.053	0.046	6.4- 23.8
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	6	0.270-0.310	0.300	0.0- 1.5	6	0.040-0.150	0.070	0.0- 1.5	6	0.270-0.400	0.345	0.0- 1.5
MAX DEPTH**	3	0.270-0.280	0.280	7.3- 22.9	3	0.090-0.160	0.140	6.7- 22.9	3	0.290-0.390	0.330	6.4- 23.8
AMMONIA (MG/L)												
0.-1.5 M DEPTH	6	0.120-0.300	0.145	0.0- 1.5	6	0.030-0.050	0.040	0.0- 1.5	6	0.030-0.060	0.045	0.0- 1.5
MAX DEPTH**	3	0.120-0.160	0.120	7.3- 22.9	3	0.060-0.110	0.070	6.7- 22.9	3	0.030-0.060	0.040	6.4- 23.8
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	6	0.300-0.800	0.600	0.0- 1.5	6	0.300-1.200	0.550	0.0- 1.5	6	0.200-0.500	0.250	0.0- 1.5
MAX DEPTH**	3	0.300-0.400	0.300	7.3- 22.9	3	0.300-0.600	0.400	6.7- 22.9	3	0.300-0.400	0.300	6.4- 23.8
SECCHI DISC (METERS)	3	0.5- 0.5	0.5		3	0.8- 1.4	0.9		3	0.5- 0.9	0.7	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

MITCHELL LAKE
STORET CODE 0104

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(6/ 6/73) S*** = 3 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(8/29/73) S*** = 3 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(10/31/73) S*** = 3 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	6	25.3- 25.6	25.6	0.0- 1.5	3	29.7- 29.9	29.8	0.0- 0.0	6	21.0- 21.5	21.1	0.0- 1.5
MAX DEPTH**	3	24.2- 25.2	25.0	9.1- 19.8	3	29.5- 29.5	29.1	9.1- 19.8	3	21.1- 21.4	21.1	11.0- 22.9
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	3	6.4- 7.4	6.6	1.5- 1.5	3	5.0- 8.0	6.8	0.0- 0.0	3	6.4- 6.4	6.4	1.5- 1.5
MAX DEPTH**	3	5.0- 6.3	6.0	9.1- 19.8	3	2.0- 5.4	4.2	9.1- 19.8	3	6.2- 6.4	6.2	11.0- 22.9
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	6	105.- 145.	110.	0.0- 1.5	3	138.- 149.	143.	0.0- 0.0	6	143.- 146.	144.	0.0- 1.5
MAX DEPTH**	3	100.- 110.	105.	9.1- 19.8	3	116.- 148.	141.	9.1- 19.8	3	145.- 147.	146.	11.0- 22.9
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	6	6.8- 7.2	7.1	0.0- 1.5	3	7.2- 8.6	7.6	0.0- 0.0	6	7.3- 7.5	7.4	0.0- 1.5
MAX DEPTH**	3	7.0- 7.2	7.1	9.1- 19.8	3	7.0- 7.1	7.1	9.1- 19.8	3	7.2- 7.3	7.2	11.0- 22.9
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	6	35.- 40.	37.	0.0- 1.5	3	49.- 54.	54.	0.0- 0.0	6	52.- 54.	54.	0.0- 1.5
MAX DEPTH**	3	34.- 39.	34.	9.1- 19.8	3	43.- 55.	52.	9.1- 19.8	3	51.- 57.	54.	11.0- 22.9
TOTAL P (MG/L)												
0.-1.5 M DEPTH	6	0.075-0.084	0.080	0.0- 1.5	3	0.040-0.054	0.043	0.0- 0.0	6	0.049-0.053	0.051	0.0- 1.5
MAX DEPTH**	3	0.070-0.087	0.085	9.1- 19.8	3	0.053-0.070	0.057	9.1- 19.8	3	0.050-0.058	0.051	11.0- 22.9
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	6	0.027-0.035	0.031	0.0- 1.5	3	0.010-0.014	0.013	0.0- 0.0	6	0.007-0.022	0.014	0.0- 1.5
MAX DEPTH**	3	0.027-0.036	0.030	9.1- 19.8	3	0.015-0.030	0.024	9.1- 19.8	3	0.020-0.021	0.021	11.0- 22.9
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	6	0.230-0.270	0.260	0.0- 1.5	3	0.050-0.120	0.090	0.0- 0.0	6	0.210-0.280	0.270	0.0- 1.5
MAX DEPTH**	3	0.240-0.250	0.240	9.1- 19.8	3	0.100-0.160	0.180	9.1- 19.8	3	0.230-0.280	0.280	11.0- 22.9
AMMONIA (MG/L)												
0.-1.5 M DEPTH	6	0.140-0.190	0.155	0.0- 1.5	3	0.050-0.130	0.0[illegible]	0.0- 0.0	6	0.010-0.040	0.020	0.0- 1.5
MAX DEPTH**	3	0.110-0.150	0.120	9.1- 19.8	3	0.050-0.130	0.0[illegible]	9.1- 19.8	3	0.010-0.030	0.020	11.0- 22.9
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	6	0.300-0.480	0.400	0.0- 1.5	3	0.500-1.000	0.900	0.0- 0.0	6	0.200-0.400	0.350	0.0- 1.5
MAX DEPTH**	3	0.300-0.300	0.300	9.1- 19.8	3	0.300-0.600	0.400	9.1- 19.8	3	0.200-0.300	0.300	11.0- 22.9
SECCHI DISK (M) (DS)	3	0.5- 0.7	0.6		3	1.0- 1.1	1.0		3	0.9- 1.0	0.9	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

Lay Lake

Sampling Date	Dominant Genera	Number per ml
06/06/73	1. Melosira	7,015
	2. Flagellates	2,551
	3. Cryptomonas	996
	4. Scenedesmus	319
	5. Stephanodiscus	119
	Other genera	999
	Total	11,999
08/29/73	1. Melosira	5,610
	2. Anabaena	1,898
	3. Flagellates	1,223
	4. Cryptomonas	633
	5. Cyclotella	509
	Other genera	2,863
	Total	12,736
10/31/73	1. Melosira	931
	2. Flagellates	910
	3. Cryptomonas	546
	4. Cyclotella	303
	5. Stephanodiscus	202
	Other genera	689
	Total	3,581

Mitchell Lake

Sampling Date	Dominant Genera	Number per ml
06/06/73	1. Melosira	2,027
	2. Flagellates	753
	3. Dinoflagellates	203
	4. Dactylococcopsis	174
	5. Cryptomonas	58
	Other genera	259
	Total	3,474
08/29/73	1. Melosira	1,801
	2. Anabaena	661
	3. Flagellates	443
	4. Cyclotella	319
	5. Scenedesmus	296
	Other genera	1,301
	Total	4,821
10/31/73	1. Flagellates	1,215
	2. Melosira	908
	3. Unknown filament	275
	4. Cyclotella	243
	5. Cryptomonas	243
	Other genera	681
	Total	3,565

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (μg/l)
06/07/73	1	5.1
	2	6.0
	3	8.6
08/29/73	1	8.4
	2	10.9
	3	12.9
10/31/73	1	2.3
	2	4.6
	3	4.7

Sampling Date	Station Number	Chlorophyll a (μg/l)
06/06/73	1	5.7
	2	6.3
	3	5.7
08/29/73	1	12.4
	2	5.2
	3	7.7
10/31/73	1	4.6
	2	4.3
	3	4.0

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

	Lay Lake			Mitchell Lake		
Spike(mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.039	0.324	9.0	0.035	0.280	8.9
0.010 P	0.049	0.324	8.7	0.045	0.280	7.8
0.020 P	0.059	0.324	9.4	0.055	0.280	8.1
0.050 P	0.089	0.324	9.5	0.085	0.280	7.9
0.025 P + 0.5 N	0.064	0.824	18.7	0.060	0.780	17.2
0.050 P + 1.0 N	0.084	1.324	28.1	0.085	1.280	29.1
1.0 N	0.039	1.324	15.2	0.035	1.280	13.2

2. Filtered and nutrient spiked -

	Lay Lake			Mitchell Lake		
Spike(mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.028	0.278	6.7	0.022	0.278	6.7
0.010 P	0.032	0.278	9.8	0.032	0.278	7.6
0.020 P	0.048	0.278	8.1	0.042	0.278	7.0
0.050 P	0.078	0.278	9.3	0.082	0.278	6.6
0.025 P + 0.5 N	0.053	0.778	15.5	0.047	0.778	11.6
0.050 P + 1.0 N	0.078	1.278	24.3	0.082	1.278	21.6
1.0 N	0.028	1.278	10.0	0.022	1.278	10.0

3. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate that the potential for primary production in Lay and Mitchell Lakes was high at the time of sample analyses. In all assays, except the filtered only for Lay Lake, increases in yield with the addition of nitrogen as well as the lack of response when only phosphorus was added indicate nitrogen limitation. In the Lay Lake filtered only sample, the .010 µg/l phosphorus spike resulted in increased yield equivalent to the nitrogen spike. Maximum growth potential was achieved with the simultaneous addition of both phosphorus and nitrogen.

The N/P ratio (12/1 or less) in the field data indicates nitrogen limitation for Lay Lake during all sampling periods. Based on N/P ratios, Mitchell Lake could be considered nitrogen limited during the June (13/1) and August (10/1) sampling periods and phosphorus limited during the October (14/1) sampling period.

The N/P ratios in the field data are not consistent with the assay limiting nutrient findings except for the October sampling round on Mitchell Lake, where the N/P ratio of 14/1 suggests primary limitation by phosphorus.

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Alabama National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the maps (pages v-vii), except for the high runoff months of January and February when two samples were collected. Sampling was begun in March 1973, and was completed in February 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Alabama District Office of the USGS for the tributary sites nearest each lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of the USGS computer program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads. Very high nutrient values were noted for Station 0103C1. Two possible reasons for this are 1) the sample may have been contaminated with bottom material, and/or 2) the sample may have been taken too close to the Clanton STP. In either case, non-point source loads for Walnut Creek were estimated by multiplying the drainage area in km^2 at that site by the mean of the nutrient loads in $kg/km^2/year$ at the Stations 0106F1, 0106H1, 0106J1, 0103D1, 0103E1, and 0108F1.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean of the nutrient loads in kg/km^2/year in Kahatchee Creek (0106F1), Peckerwood Creek (0106H1), Paint Creek (0106J1), Yellowleaf Creek (0108D1), Weogufka Creek (0108E1), and Hatchett Creek (0108F1), and multiplying the means by the ZZ area in km^2.

The operators of the Sylacauga #1, Bon Air, Childersburg West, Calera, Columbiana, Wilsonville, and Clanton wastewater treatment plants provided monthly effluent samples and corresponding flow data. The operators of Fairmont and Oldfield wastewater treatment plants provided monthly effluent samples, without corresponding flow data (see Appendix D). Nutrient loads for these two plants were estimated using 1.134 kg P and 3.401 kg N/Capita/year.

A. Waste Sources:

1. Known municipal -

Name	Population Served	Treatment	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
LAY LAKE				
Sylacauga #3 (Fairmont)	400	Activated sludge	0.151*	Tributary to Tallasseehatchie Creek
Sylacauga #2 (Oldfield)	300	Extended aeration (Activated sludge)	0.114*	Crooked Creek/ Tallasseehatchie Creek
Sylacuaga #1	12,200	Trickling filter	5.299	Chirtee Creek/ Tallasseehatchie Creek
Bon Air	218	Septic tank	0.276	Griffen Branch/ Tallasseehatchie Creek
Childersburg West	4,000	Stabilization pond	1.317	Baileys Branch
Calera	1,655	Activated sludge	0.460	Waxahatchie Creek
Columbiana	3,000	Stabilization pond	1.211	Waxahatchie Creek
Wilsonville	659	Activated sludge	0.126	Bullett Creek
MITCHELL LAKE				
Clanton	4,500	Trickling filter	2.769	Walnut Creek

*Estimate based upon 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Lay Lake

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) Coosa River	799,570	92.9
B(1) Waxahatchee Creek	8,250	1.0
C(1) Little Beeswax Creek	515	0.1
D(1) Beeswax Creek	855	0.1
E(1) Yellowleaf Creek	13,215	1.5
F(1) Kahatchee Creek	480	0.1
G(1) Cedar Creek	1,835	0.2
H(1) Peckerwood Creek	725	0.1
J(1) Paint Creek	300	<0.1
b. Minor tributaries and immediate drainage (nonpoint load) -	4,515	0.5

Mitchell Lake

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) Coosa River	1,051,970	96.9
B(1) Cargle Creek	565	0.1
C(1) Walnut Creek	1,360	0.1
D(1) Yellowleaf Creek	3,285	0.3
E(1) Weogufka Creek	3,605	0.3
F(1) Hatchett Creek	14,820	1.4
b. Minor tributaries and immediage drainage (nonpoint load) -	3,820	0.4

Lay Lake

Source	kg P/yr	% of total
c. Known municipal STP's -		
Sylacauga #3 (Fairmont)	450	0.1
Sylacauga #2 (Oldfield)	340	<0.1
Sylacauga #1	21,460	2.5
Bon Air	310	<0.1
Childersburg West	2,835	0.3
Calera	1,270	0.1
Columbiana	2,300	0.3
Wilsonville	220	0.1
d. Septic tanks* -	20	<0.1
e. Known industrial - None		
f. Direct precipitation**	810	0.1
Total	860,275	100.0

2. Outputs -

A(1) Coosa River 1,051,970

3. Net annual P export*** - 191,695

Mitchell Lake

Source	kg P/yr	% of total
c. Known municipal STP's -		
Clanton	6,025	0.5
d. Septic tanks* -	20	<0.1
e. Known industrial - None		
f. Direct precipitation**	415	<0.1
Total	1,085,885	100.0

2. Outputs -

A(1) Coosa River 1,126,335

3. Net annual P export*** - 40,450

*Estimate based on 75 lakeside residences.
**Estimated (see NES Working Paper No. 175).
***Export probably due to unknown sources and/or sampling error.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Lay Lake

Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) Coosa River	13,176,705	94.6
B(1) Waxahatchee Creek	212,155	1.5
C(1) Little Beeswax Creek	9,720	0.1
D(1) Beeswax Creek	26,725	0.2
E(1) Yellowleaf Creek	150,175	1.1
F(1) Kahatchee Creek	16,975	0.1
G(1) Cedar Creek	39,180	0.3
H(1) Peckerwood Creek	25,775	0.2
J(1) Paint Creek	13,600	0.1
b. Minor tributaries and immediate drainage (nonpoint load) -	158,005	1.1

Mitchell Lake

Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) Coosa River	12,157,280	93.4
B(1) Cargle Creek	18,600	0.1
C(1) Walnut Creek	47,630	0.4
D(1) Yellowleaf Creek	131,090	1.0
E(1) Weogufka Creek	97,230	0.7
F(1) Hatchett Creek	399,695	3.1
b. Minor tributaries and immediate drainage (nonpoint load) -	133,645	1.0

Lay Lake

Source	kg N/yr	% of total
c. Known municipal STP's -		
Sylacauga #3 (Fairmont)	1,360	<0.1
Sylacauga #2 (Oldfield)	1,020	<0.1
Sylacauga #1	34,950	0.3
Bon Air	1,230	<0.1
Childersburg West	3,810	<0.1
Calera	1,470	<0.1
Columbiana	4,605	<0.1
Wilsonville	360	<0.1
d. Septic tanks* -	800	<0.1
e. Known industrial - None		
f. Direct precipitation**	52,425	0.4
Total	13,931,045	100.0

2. Outputs -

A(1) Coosa River	12,157,280
3. Net annual N accumulation	1,773,765

Mitchell Lake

Source	kg N/yr	% of total
c. Known municipal STP's -		
Clanton	11,385	0.1
d. Septic tanks* -	800	<0.1
e. Known industrial - None		
f. Direct precipitation**	25,510	0.2
Total	13,022,865	100.0

A(1) Coosa River	12,247,875
3. Net annual N accumulation	774,990

*Estimate based on 75 lakeside residences.
**Estimated (see NES Working Paper No. 175).

D. **Mean Annual Nonpoint Nutrient Export by Subdrainage Area:**

Tributary	kg P/km^2/yr	kg N/km^2/yr
Lay Lake		
Coosa	37	606
Waxahatchee Creek	18	463
Little Beeswax Creek	21	400
Beeswax Creek	19	607
Yellowleaf Creek (0106E1)	27	310
Kahatchee Creek	12	423
Cedar Creek	26	556
Peckerwood Creek	11	376
Paint Creek	7	328
Mitchell Lake		
Coosa River	45	520
Cargle Creek	21	697
Walnut Creek	12	420
Yellowleaf Creek (0108D1)	16	642
Weogufka Creek	12	338
Hatchett Creek	15	415

F. Yearly Loadings:

In the following table, the existing phosphorus annual loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his eutrophic loading is that at which the receiving waters would become eutrophic or remain eutrophic; his oligotrophic loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between eutrophic and oligotrophic.

Note that Vollenweider's model may not apply to lakes with short hydraulic retention times or in which light penetration is severely restricted by high concentrations of suspended solids in the surface waters.

	Total Yearly Phosphorus Loading ($g/m^2/yr$)	
	Lay Lake	Mitchell Lake
Estimated loadings for	17.72	45.95
Vollenweider's eutrophic loadings	3.10	3.98
Vollenweider's oligotrophic loadings	1.55	1.97

V. LITERATURE REVIEWED

U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. National Environmental Research Center, Las Vegas, Nevada, and Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon.

Vollenweider, R. A., 1975. Input-Output Models With Final Reference to the Phosphorus Loading Concept in Limnology. Schweiz. A. Hydrol. 37: 53-84.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107 x 10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 0106 LAY LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 23387.7

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
0106A1	23387.7	553.40	715.48	848.47	649.39	416.09	236.84	213.68	176.64	161.97	174.38	242.05	466.63	402.24
0106A2	21730.1	521.11	496.73	580.83	402.30	385.85	190.80	171.69	169.76	163.93	175.45	222.77	327.97	316.75
0106B1	458.4	15.01	24.92	18.12	14.30	4.81	1.22	1.50	0.62	0.62	0.54	1.67	7.08	7.43
0106C1	24.3	0.821	1.331	0.963	0.765	0.311	0.185	0.127	0.059	0.062	0.054	0.136	0.453	0.427
0106D1	44.0	1.56	2.44	1.87	1.50	0.65	0.24	0.28	0.14	0.15	0.13	0.28	0.88	0.83
0106E1	484.3	13.79	25.43	19.26	15.86	5.38	2.38	2.49	1.44	0.74	0.65	2.21	7.84	8.01
0106F1	40.1	1.36	2.15	1.59	1.30	0.57	0.20	0.24	0.12	0.12	0.11	0.25	0.76	0.72
0106G1	70.4	1.61	2.07	2.46	2.27	1.16	0.76	0.68	0.45	0.34	0.31	0.62	1.10	1.15
0106H1	68.6	1.25	1.64	1.95	1.81	0.91	0.57	0.51	0.31	0.23	0.22	0.45	0.82	0.89
0106J1	41.4	0.71	0.93	1.10	1.02	0.51	0.31	0.28	0.18	0.12	0.12	0.25	0.45	0.50
0106ZZ	424.8	9.91	12.74	15.15	14.02	7.22	4.59	4.25	2.78	2.10	2.04	3.96	6.80	7.09

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 23387.7
SUM OF SUB-DRAINAGE AREAS = 23386.6

TOTAL FLOW IN = 4137.16
TOTAL FLOW OUT = 4846.93

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0106A1	3	73	913.501	3	330.174				
	4	73	962.490	7	1440.761				
	5	73	850.872	5	340.085				
	6	73	564.355	3	831.666				
	7	73	279.086	14	242.675				
	8	73	206.685	25	224.836				
	9	73	130.796	9	34.263				
	10	73	189.124	21	0.0				
	11	73	221.211	18	29.931				
	12	73	512.818	9	63.996				
	1	74	1093.596	5	1022.238	19	866.495		
	2	74	993.921	2	883.202	16	1277.090		
0106A2	3	73	894.246	3	376.897	30	669.977		
	4	73	869.844						
	5	73	841.860	14	703.957				
	6	73	556.426	12	708.771				
	7	73	261.081	3	336.687				
	8	73	168.372	7	384.123				
	9	73	126.293	6	197.368				
	10	73	200.200	5	290.531				
	11	73	211.527	18	4.248				
	12	73	464.679	6	461.241				
	1	74	1027.901	8	1114.268	26	911.802		
	2	74	920.864	6	771.068	21	955.977		

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 0106 LAY LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
010681	3	73	24.919	3	28.954				
	4	73	24.069	7	58.050				
	5	73	11.893	5	3.455				
	6	73	2.605	3	3.256				
	7	73	2.633	14	1.699				
	8	73	1.812	25	0.283				
	9	73	0.136	9	0.164				
	10	73	0.340	21	0.082				
	11	73	5.324	18	0.096				
	12	73	16.849	9	4.729				
	1	74	26.051	5	23.503	19	9.769		
	2	74	21.096	2	11.751	16	49.554		
0106C1	3	73	1.303	4	0.793				
	4	73	1.246	7	3.115				
	5	73	0.680	14	0.453				
	6	73	0.199	13	0.195				
	7	73	0.201	10	0.623				
	8	73	0.147	9	0.241				
	9	73	0.017	6	0.023				
	10	73	0.020	4	0.025				
	11	73	0.294	5	0.014				
	12	73	0.986	5	1.019				
	1	74	1.416	7	2.294	24	0.963		
	2	74	1.104	13	0.510				
010601	3	73	2.407	4	1.501				
	4	73	2.322	7	5.522				
	5	73	1.303	14	0.963				
	6	73	0.425	13	0.425				
	7	73	0.425	10	1.218				
	8	73	0.340	9	0.510				
	9	73	0.048	6	0.054				
	10	73	0.051	4	0.065				
	11	73	0.623	5	0.037				
	12	73	1.727	5	1.926				
	1	74	2.520	7	4.106	24	1.869		
	2	74	2.095	13	1.019				
0106E1	3	73	25.485	4	12.459				
	4	73	24.636	7	60.881				
	5	73	13.026	14	8.920				
	6	73	3.568	13	3.540				
	7	73	3.596	10	12.035				
	8	73	2.662	9	4.361				
	9	73	0.311	6	0.368				
	10	73	0.340	4	0.453				
	11	73	5.437	5	0.255				
	12	73	17.500	5	16.990				
	1	74	27.751	7	45.307	24	18.972		
	2	74	22.370	13	9.628				

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 0106 LAY LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0106F1	3	73	2.095	3	1.812	30	1.359		
	4	73	2.010						
	5	73	1.133	14	0.821				
	6	73	0.368	12	0.280				
	7	73	0.368	3	0.178				
	8	73	0.275	7	0.278				
	9	73	0.037	6	0.042				
	10	73	0.040	5	0.045				
	11	73	0.510	8	0.028				
	12	73	1.472	6	0.934				
	1	74	2.209	8	2.718	26	1.869		
	2	74	1.841	6	0.906	21	1.586		
0106G1	3	73	3.879	3	1.133	30	2.520		
	4	73	3.313						
	5	73	3.087	14	1.841				
	6	73	1.869	12	3.143				
	7	73	0.991	21	0.850				
	8	73	0.538	7	0.680				
	9	73	0.311	6	0.311				
	10	73	0.311	5	0.368				
	11	73	0.425	8	0.396				
	12	73	0.906	6	0.680				
	1	74	2.407	8	1.954	26	1.926		
	2	74	2.747	6	1.897	21	2.152		
0106H1	3	73	3.256	3	0.878				
	4	73	2.718	5	1.954				
	5	73	2.520	9	4.955				
	6	73	1.444	9	1.982				
	7	73	0.736	3	0.623				
	8	73	0.396	7	0.510				
	9	73	0.221	9	0.218				
	10	73	0.224	4	0.275				
	11	73	0.297	9	0.963				
	12	73	0.963	5	0.566				
	1	74	1.897	8	1.529	26	1.501		
	2	74	2.067	11	1.104	26	1.331		
0106J1	3	73	1.841	3	0.481				
	4	73	1.557	5	1.104				
	5	73	1.416	9	2.832				
	6	73	0.821	9	1.133				
	7	73	0.425	3	0.340				
	8	73	0.218	7	0.283				
	9	73	0.119	9	0.119				
	10	73	0.122	4	0.147				
	11	73	0.167	9	0.538				
	12	73	0.396	5	0.311				
	1	74	1.076	8	0.850	26	0.850		
	2	74	1.161	11	0.623	26	0.736		

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 0106 LAY LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
010622	3	73	23.843	3	7.079	4	9.628	30	15.574
	4	73	20.388	5	15.088	7	53.802		
	5	73	19.199	5	10.336	9	34.830	14	11.185
	6	73	11.327	3	10.194	9	15.291	12	19.680
	6	73	11.327	13	28.317				
	7	73	6.173	3	5.239	10	5.663	14	10.477
	7	73	6.173	21	5.239				
	8	73	3.398	7	4.248	9	4.955	25	2.350
	9	73	1.982	8	1.897	9	1.926		
	10	73	1.982	4	2.407	5	2.294		
	11	73	2.690	8	2.435	9	7.787		
	12	73	5.663	5	4.757	6	4.106	9	2.520
	12	73	5.663	16	4.531				
	1	74	14.923	8	12.459	26	11.751		
	2	74	24.069	6	11.610	11	8.778	21	13.309

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 010R MITCHELL RESERVOIR

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 25325.0

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
0108A1	25325.0	676.06	812.04	930.32	668.84	471.79	251.88	228.35	199.27	174.77	191.05	225.63	504.66	442.79
0108A2	23387.7	553.40	715.40	840.47	649.39	416.09	236.84	213.68	176.64	161.97	174.38	242.05	466.63	402.24
0108B1	26.7	0.991	1.586	1.189	0.963	0.425	0.150	0.181	0.091	0.091	0.082	0.193	0.566	0.536
0108C1	113.4	4.67	7.22	5.52	4.53	2.04	0.74	0.88	0.45	0.45	0.40	0.93	2.69	2.51
0108D1	204.4	6.80	11.19	8.21	6.51	2.55	0.82	0.99	0.45	0.45	0.40	1.08	3.54	3.53
0108E1	287.5	5.66	7.50	8.92	8.50	3.96	2.35	2.12	1.30	0.93	0.91	1.98	3.68	3.96
0108F1	963.5	22.65	28.88	33.70	32.00	16.42	10.48	9.49	6.23	4.67	4.53	8.78	15.29	16.01
0108ZZ	341.9	7.93	10.34	12.03	11.33	5.80	3.74	3.40	2.21	1.64	1.61	3.17	5.49	5.70

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 25325.0
SUM OF SUB-DRAINAGE AREAS = 25325.0

TOTAL FLOW IN = 5236.45
TOTAL FLOW OUT = 5334.65

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0108A1	3	73	913.501	3	290.531				
	4	73	1117.383	7	1874.575				
	5	73	981.462	5	456.184				
	6	73	657.517	3	915.484				
	7	73	333.006	14	285.434				
	8	73	203.032	25	203.598				
	9	73	149.966	9	77.871				
	10	73	204.929	21	0.0				
	11	73	247.206	18	42.277				
	12	73	575.681	9	230.669				
	1	74	1245.375	5	1203.466	19	931.624		
	2	74	1146.832	2	965.604	16	1557.427		
010HA2	3	73	913.501	3	330.174				
	4	73	962.490	7	1440.761				
	5	73	850.072	5	340.085				
	6	73	564.355	3	831.666				
	7	73	279.006	14	242.675				
	8	73	206.685	25	224.836				
	9	73	130.796	9	34.263				
	10	73	189.128	21	92.596				
	11	73	221.211	18	30.016				
	12	73	512.818	9	92.313				
	1	74	1093.596	5	1022.238	19	866.779		
	2	74	993.921	2	883.202	16	1277.090		

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 0104 MITCHELL RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
010AA1	3	73	1.557	3	1.359				
	4	73	1.501	7	3.455				
	5	73	0.450	5	0.340				
	6	73	0.272	3	0.311				
	7	73	0.272	14	0.195				
	8	73	0.210	25	0.051				
	9	73	0.031	9	0.034				
	10	73	0.031	21	0.020				
	11	73	0.396	18	0.023				
	12	73	1.104	9	0.396				
	1	74	1.642	5	1.501	19	0.680		
	2	74	1.359	2	0.793	16	2.973		
010AC1	3	73	7.079	3	6.088				
	4	73	6.824	7	15.038				
	5	73	3.964	5	1.586				
	6	73	1.303	3	1.529				
	7	73	1.303	14	0.934				
	8	73	1.019	25	0.263				
	9	73	0.153	9	0.176				
	10	73	0.161	21	0.105				
	11	73	1.869	18	0.119				
	12	73	5.097	9	1.982				
	1	74	7.504	5	6.853	19	3.115		
	2	74	6.286	2	3.738	16	13.309		
010AD1	3	73	10.902	3	9.486				
	4	73	10.506	7	26.051				
	5	73	5.637	5	1.982				
	6	73	1.557	3	1.869				
	7	73	1.557	14	1.076				
	8	73	1.189	25	0.249				
	9	73	0.136	9	0.159				
	10	73	0.144	21	0.088				
	11	73	2.350	18	0.102				
	12	73	7.504	9	2.549				
	1	74	11.893	5	10.760	19	4.332		
	2	74	9.628	2	5.210	16	22.370		
010AE1	3	73	15.801	3	3.823				
	4	73	13.026	7	37.945				
	5	73	11.950	5	5.890				
	6	73	6.654	3	5.890				
	7	73	3.256	14	6.003				
	8	73	1.642	25	1.104				
	9	73	0.878	9	0.850				
	10	73	0.906	21	0.623				
	11	73	1.246	18	0.736				
	12	73	2.973	9	1.189				
	1	74	9.061	5	13.026	19	2.775		
	2	74	9.628	2	5.097	16	25.202		

TRIBUTARY FLOW INFORMATION FOR ALABAMA 07/22/76

LAKE CODE 010H MITCHELL RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
010HF1	3	73	55.218	3	15.857				
	4	73	46.723	7	126.010				
	5	73	43.042	5	23.220				
	6	73	26.051	3	23.220				
	7	73	13.875	14	23.786				
	8	73	7.646	25	5.324				
	9	73	4.474	9	4.332				
	10	73	4.531	21	3.171				
	11	73	5.947	18	3.968				
	12	73	12.743	9	5.663				
	1	74	33.980	5	46.440	19	12.035		
	2	74	35.398	2	20.388	16	82.119		
010HZ2	3	73	19.255	3	5.663				
	4	73	16.424	7	44.741				
	5	73	15.319	5	8.212				
	6	73	9.203	3	8.212				
	7	73	4.955	14	8.353				
	8	73	2.747	25	1.897				
	9	73	1.586	9	1.557				
	10	73	1.614	21	1.133				
	11	73	2.152	18	1.388				
	12	73	4.531	9	2.039				
	1	74	12.035	5	16.141	19	4.248		
	2	74	12.743	2	7.221	16	28.600		

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/07/22

010601
33 11 45.0 086 28 45.0 3
LAY LAKE
01121 ALABAMA

033591

11EPALES 2111202
0026 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/06	16 15	0000	25.0		19	115	7.20	42	0.150	0.800	0.300	0.045
	16 15	0005	25.0	5.6		110	7.20	42	0.130	0.400	0.290	0.039
	16 15	0015	25.0	5.7		115	7.20	42	0.140	0.300	0.290	0.038
	16 15	0024	25.1	5.7		115	7.20	43	0.120	0.400	0.280	0.038
73/08/29	10 45	0000	29.6		34	172	7.30	57	0.040	0.500	0.140	0.027
	10 45	0005	29.3	4.0		170	7.30	55	0.040	0.300	0.150	0.023
	10 45	0022	29.3	4.0		172	7.20	55	0.060	0.300	0.160	0.021
73/10/31	09 13	0000	20.0		18	140	7.20	48	0.040	0.200K	0.400	0.067
	09 13	0005	20.1	5.2		140	7.20	47	0.030	0.200	0.390	0.056
	09 13	0015	20.0	5.0		140	7.20	48	0.030	0.500	0.390	0.055
	09 13	0021	20.0	5.2		140	7.20	48	0.030	0.300	0.390	0.053

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/06	16 15	0000	0.091	5.1
	16 15	0005	0.045	
	16 15	0015	0.092	
	16 15	0024	0.093	
73/08/29	10 45	0000	0.053	8.4
	10 45	0005	0.034	
	10 45	0022	0.055	
73/10/31	09 13	0000	0.110	2.3
	09 13	0005	0.104	
	09 13	0015	0.120	
	09 13	0021	0.120	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010602
32 58 00.0 086 30 50.0 3
LAY LAKE
01037 ALABAMA
033592

TIEPALES 2111202
0078 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/07	09 50	0000	25.9		20	130	6.90	42	0.300	0.600	0.310	0.039
	09 50	0005	25.8	6.0		105	7.00	41	0.120	0.300	0.270	0.031
	09 50	0015	25.6	5.8		105	7.00	42	0.140	0.400	0.290	0.032
	09 50	0045	25.5	5.6		105	7.00	43	0.140	0.300	0.300	0.033
	09 50	0075	25.0	5.0		105	6.90	42	0.160	0.300	0.280	0.034
73/08/29	09 30	0000	30.2		56	156	8.20	51	0.050	1.200	0.040	0.007
	09 30	0005	30.1	7.2		155	7.80	52	0.030	0.600	0.040	0.010
	09 30	0015	29.5	4.8		154	7.33	52	0.050	0.500	0.060	0.009
	09 30	0030	29.5	6.0		154	7.20	51	0.050	0.500	0.080	0.009
	09 30	0050	29.4	3.1		151	7.10	52	0.060	0.500	0.110	0.011
	09 30	0065	29.3	2.6		150	7.10	51	0.070	0.500	0.150	0.013
	09 30	0075	29.3	2.0		152	7.00	50	0.110	0.600	0.140	0.018
73/10/31	10 05	0003	21.3		37	145	7.30	51	0.050	0.200	0.280	0.025
	10 05	0005	21.3	5.4		145	7.30	51	0.040	0.400	0.270	0.021
	10 05	0015	21.3	5.6		143	7.20	52	0.040	0.300	0.280	0.023
	10 05	0040	21.3	5.6		145	7.23	54	0.030	0.300	0.280	0.024
	10 05	0074	21.3	5.8		148	7.20	53	0.040	0.400	0.290	0.026

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/07	09 50	0000	0.084	6.0
	09 50	0005	0.074	
	09 50	0015	0.077	
	09 50	0045	0.079	
	09 50	0075	0.076	
73/08/29	09 30	0000	0.036	10.9
	09 30	0005	0.023	
	09 30	0015	0.020	
	09 30	0030	0.024	
	09 30	0050	0.026	
	09 30	0065	0.030	
	09 30	0075	0.037	
73/10/31	10 05	0000	0.052	4.6
	10 05	0005	0.053	
	10 05	0015	0.051	
	10 05	0040	0.055	
	10 05	0074	0.073	

STORET RETRIEVAL DATE 76/07/22

010603
33 04 05.0 086 30 55.0 3
LAY LAKE
01037 ALABAMA
033591

11EPALES 2111202
0042 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/07	10 45	0000	25.6		19	105	7.00	44	0.140	0.600	0.300	0.035
	10 45	0005	25.6	5.6		105	7.00	42	0.300	0.600	0.310	0.039
	10 45	0015	25.5	5.6		105	6.90	44	0.120	0.300	0.260	0.033
	10 45	0025	25.4	5.4		105	6.90	46	0.120	0.400	0.280	0.035
	10 45	0034	25.4	5.2		105	6.90	47	0.120	0.300	0.270	0.033
73/08/29	10 15	0000	30.0		33	173	7.30	55	0.040	0.600	0.070	0.013
	10 15	0005	29.9	4.6		172	7.20	56	0.050	0.400	0.070	0.013
	10 15	0020	29.8	4.6		171	7.10	55	0.050	0.300	0.090	0.013
	10 15	0034	29.7	4.2		171	7.10	55	0.070	0.400	0.090	0.011
73/10/31	09 38	0000	20.3		27	141	7.30	47	0.060	0.500	0.350	0.056
	09 38	0005	20.3	5.6		142	7.20	46	0.050	0.300	0.340	0.050
	09 38	0015	20.3	5.4		141	7.20	48	0.060	0.300	0.340	0.053
	09 38	0030	20.3	5.8		140	7.30	47	0.060	0.300	0.330	0.046

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/07	10 45	0000	0.076	8.0
	10 45	0005	0.044	
	10 45	0015	0.042	
	10 45	0025	0.041	
	10 45	0034	0.047	
73/08/29	10 15	0000	0.054	12.9
	10 15	0005	0.033	
	10 15	0020	0.034	
	10 15	0034	0.035	
73/10/31	09 38	0000	0.043	6.7
	09 38	0005	0.040	
	09 38	0015	0.045	
	09 38	0030	0.047	

STORET RETRIEVAL DATE 76/07/22

010801
32 48 30.0 086 25 45.0 3
MITCHELL LAKE
01037 ALABAMA
033591

11EPALES 2111202
0070 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/06	10 15	0000	25.8		28	145	6.60	36	0.130	0.900	0.230	0.027
	10 15	0005	25.5	7.8		105	6.90	35	0.160	0.700	0.260	0.032
	10 15	0015	25.0	6.4		115	7.00	35	0.160	0.300	0.260	0.031
	10 15	0040	24.6	6.2		115	7.00	36	0.130	0.300	0.250	0.030
	10 15	0065	24.2	5.8		100	7.00	34	0.150	0.300	0.240	0.027
73/08/29	16 10	0000	29.9	8.0	45	138	8.60	49	0.050	1.000	0.050	0.010
	16 10	0015	29.3	6.0		138	7.40	49	0.050	0.400	0.060	0.013
	16 10	0030	29.2	5.0		136	7.20	50	0.060	0.400	0.080	0.015
	16 10	0045	29.0			134						
	16 10	0065	28.5	2.6		116	7.00	43	0.130	0.600	0.100	0.024
73/10/31	12 05	0000	21.4		37	144	7.50	54	0.010K	0.400	0.280	0.019
	12 05	0005	21.5	6.4		144	7.40	54	0.010K	0.200	0.210	0.007
	12 05	0015	21.4	6.2		146	7.40	54	0.010K	0.300	0.240	0.016
	12 05	0040	21.4	6.4		146	7.30	54	0.010K	0.300	0.210	0.020
	12 05	0075	21.4	6.2		146	7.20	51	0.030	0.300	0.230	0.020

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/06	10 15	0000	0.089	5.7
	10 15	0005	0.086	
	10 15	0015	0.075	
	10 15	0040	0.078	
	10 15	0065	0.078	
73/08/29	16 10	0000	0.054	12.4
	16 10	0015	0.035	
	16 10	0030	0.033	
	16 10	0065	0.078	
73/10/31	12 05	0000	0.051	4.6
	12 05	0005	0.051	
	12 05	0015	0.049	
	12 05	0040	0.053	
	12 05	0075	0.051	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010802
32 51 15.0 086 27 00.0 3
MITCHELL LAKE
01037 ALABAMA
033591

11EPALES 2111202
0035 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/06	13 30	0000	25.6		24	115	7.10	36	0.180	0.600	0.270	0.035
	13 30	0005	25.3	6.4		110	7.20	38	0.150	0.400	0.260	0.031
	13 30	0015	25.1	6.0		110	7.10	37	0.120	0.400	0.260	0.033
	13 30	0030	25.0	6.0		110	7.10	39	0.120	0.300	0.250	0.030
73/08/29	16 45	0000	29.8	6.8	40	143	7.60	54	0.060	0.900	0.080	0.013
	16 45	0015	29.1	4.6		141	7.00	53	0.070	0.500	0.140	0.027
	16 45	0030	29.0	4.2		141	7.00	52	0.080	0.300	0.150	0.036
	16 45	0042	29.1	4.2		141	7.10	52	0.090	0.300	0.160	0.030
73/10/31	12 28	0000	21.1		39	146	7.40	53	0.040	0.400	0.270	0.020
	12 28	0005	21.2	6.4		146	7.40	52	0.030	0.300	0.270	0.021
	12 28	0015	21.1	6.2		147	7.30	55	0.030	0.300	0.280	0.027
	12 28	0036	21.1	6.2		147	7.30	57	0.020	0.300	0.280	0.021

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/06	13 30	0000	0.087	6.3
	13 30	0005	0.084	
	13 30	0015	0.084	
	13 30	0030	0.085	
73/08/29	16 45	0000	0.043	5.2
	16 45	0015	0.049	
	16 45	0030	0.057	
	16 45	0042	0.053	
73/10/31	12 28	0000	0.049	4.3
	12 28	0005	0.050	
	12 28	0015	0.053	
	12 28	0036	0.050	

STORET RET-IEVAL DATE 76/07/22

010603
32 54 30.0 086 30 00.0 3
MITCHELL LAKE
01037 ALABAMA

033592

11EPALES 2111202
0035 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/06	14 10	0000	25.4		19	110	7.20	38	0.160	0.600	0.260	0.034
	14 10	0005	25.4	6.4		110	7.20	40	0.120	0.300	0.250	0.031
	14 10	0015	25.3	6.4		110	7.20	40	0.120	0.300	0.250	0.031
	14 10	0031	25.2	6.3		105	7.20	38	0.110	0.300	0.240	0.036
73/08/29	17 15	0000	29.7	5.8	38	149	7.20	54	0.130	0.500	0.120	0.014
	17 15	0005	29.5			147						
	17 15	0015	29.5	5.4		148	7.10	55	0.080	0.400	0.120	0.014
	17 15	0030	29.5	5.8		148	7.10	55	0.060	0.400	0.100	0.016
73/10/31	10 29	0000	21.0		36	143	7.30	53	0.040	0.400	0.270	0.022
	10 29	0005	21.0	6.4		144	7.30	54	0.010K	0.300	0.240	0.009
	10 29	0015	21.0	6.4		144	7.20	54	0.010K	0.300	0.260	0.020
	10 29	0036	21.1	6.4		145	7.20	54	0.010K	0.200	0.280	0.021

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/06	14 10	0000	0.088	5.7
	14 10	0005	0.076	
	14 10	0015	0.084	
	14 10	0031	0.087	
73/08/29	17 15	0000	0.040	7.7
	17 15	0015	0.039	
	17 15	0030	0.057	
73/10/31	10 29	0000	0.053	4.0
	10 29	0005	0.052	
	10 29	0015	0.052	
	10 29	0036	0.058	

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/07/22

0106A1 LS0106A1
32 58 00.0 086 31 00.0 4
COOSA RIVER
01 MAP CHILTON CO
O/LAY LAKE 033592
MIDSTREAM FROM FERRY S OF LAY DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	01 45		0.300	2.600	0.105	0.033	0.075
73/04/07	10 05		0.230	0.810	0.310	0.042	0.090
73/05/05	09 40		0.210	0.940	0.132	0.033	0.080
73/06/03	09 45		0.176	1.380	0.250	0.033	0.090
73/07/14	09 55		0.250	0.300	0.052	0.030	0.067
73/08/25	09 00		0.069	0.270	0.042	0.011	0.042
73/09/09	11 45		0.086	0.530	0.040	0.014	0.050
73/10/21	10 00		0.210	0.400	0.024	0.023	0.045
73/11/18	10 00		0.330	0.500	0.025	0.052	0.065
73/12/09	09 20		0.270	0.300	0.056	0.052	0.095
74/01/05	10 10		0.264	0.300	0.052	0.072	0.130
74/01/19	09 40		0.312	0.400	0.092	0.070	0.165
74/02/02	14 50		0.350	0.500	0.050	0.040	0.040
74/02/16	10 00		0.336	0.800	0.120	0.035	0.085

STORET RETRIEVAL DATE 76/07/22

010682 L3010682
33 07 30.0 086 22 00.0 4
COOSA RIVER
01 MAP SHELBY CO
LAY LAKE 033591
MASS 175 FT BELO HWY 280 BRDG
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	12 00		0.300	1.050	0.060	0.054	0.100
73/03/30	10 25		0.294	3.400	0.160	0.040	0.100
73/05/14	10 30		0.154	2.400	0.070	0.036	0.087
73/06/12	08 30		0.231	0.630	0.066	0.058	0.100
73/07/03	11 15		0.154	4.400	0.176	0.021	0.060
73/08/07	13 30		0.120	0.520	0.069	0.037	0.050
73/09/06	17 45		0.069	0.290	0.013	0.019	0.060
73/10/25	11 45		0.220	0.320	0.025	0.032	0.070
73/11/18	11 30		0.390	0.850	0.044	0.060	0.075
73/12/06	12 20		0.270	0.600	0.052	0.068	0.095
74/01/08	12 40		0.288	0.350	0.044	0.044	0.110
74/01/26	08 45		0.430	0.400	0.056	0.044	0.105
74/02/06	12 25		0.368	0.100	0.035	0.045	0.080
74/02/21	17 40		0.300	0.200	0.045	0.040	0.085

STORET RETRIEVAL DATE 76/07/22

010681 LS0106M1
33 32 30.0 086 35 30.0 4
WAXAHATCHEE CREEK
01 MAP CHILTON CO
T/LAY LAKE 033591
CO RT 145 APPROX 12 MI N OF CLANTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	15 30		0.017	1.680	0.100	0.014	0.045
73/04/07	09 15		0.075	2.600	0.860	0.030	0.160
73/05/05	11 00		0.046	0.380	0.029		0.035
73/06/03	10 40		0.036	0.385	0.120	0.011	0.055
73/07/14	11 00		0.010K	0.390	0.023	0.007	0.035
73/08/25	10 00		0.010K	0.400	0.018	0.008	0.035
73/09/09	10 40		0.010K	0.600	0.015	0.005K	0.040
73/10/21	11 00		0.019	0.550	0.015	0.007	0.030
73/11/18	11 10		0.088	0.550	0.022	0.005K	0.010
73/12/09	10 35		0.120	0.300	0.032	0.008	0.045
74/01/05	10 45		0.132	0.400	0.068	0.016	0.030
74/01/19	11 00		0.144	0.900	0.156	0.010	0.050
74/02/02	16 00		8.700	1.100	0.130	0.015	0.040
74/02/16	11 38		0.076	0.800	0.055	0.015	0.045

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/07/22

01060 LS0106C1
33 09 30.0 086 32 00.0 4
LITTLE BEESWAX CREEK
01 MAP SHELBY CO
TAYLOR LAKE 033591
BRDG ON RD 1.5 MI SE KINGDOM CROSSROADS
11FPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/04	13 35		0.220	0.660	0.032	0.006	0.025
73/04/07	14 15		0.052	1.500	0.092	0.028	0.045
73/05/14	18 25		0.270	0.170	0.020	0.014	0.020
73/06/13	18 50		0.180	0.340	0.013	0.028	0.030
73/07/10	10 00		0.440	0.420	0.054	0.005K	0.015
73/08/09	09 30		0.340	0.300	0.039	0.020	0.040
73/09/06	11 00		0.315	0.170	0.020	0.005K	0.020
73/10/04	14 30		0.240	0.460	0.060	0.005K	0.035
73/11/05	17 50		0.054	0.650	0.034	0.006	0.045
73/12/05			0.108	0.200	0.012	0.008	0.020
74/01/07	17 55		0.192	0.300	0.012	0.008	0.035
74/01/24	11 30		0.312	0.100K	0.028	0.008	0.030
74/02/13	10 00		0.384	0.100	0.020	0.015	0.015
74/03/01	17 00		0.168	0.400	0.025	0.010	0.075

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010601 L5010601
33 11 00.0 086 32 40.0 4
BEESWAX CREEK
01 MAP SHELBY CO
T/LAY LAKE 033591
BRDG ON C HWY 5 MI WSW OF WILSONVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/04	13 50		0.240	1.700	0.054	0.009	0.035
73/04/07	14 30		0.069	3.500	0.180	0.076	0.165
73/05/14	18 35		0.350	0.230	0.027	0.017	0.025
73/06/13	19 00		0.320	0.320	0.018	0.019	0.025
73/07/10	09 45		0.240	0.300	0.019	0.009	0.015
73/08/09	09 00		0.198	0.295	0.012	0.023	0.040
73/09/06	10 41		0.086	0.170	0.011	0.005K	0.020
73/10/04	15 45		0.096	0.520	0.032	0.009	0.025
73/11/05	18 00		0.015	0.800	0.017	0.009	0.030
73/12/05			0.232	0.200	0.016	0.016	0.016
74/01/07	18 05		0.280	0.400	0.020	0.028	0.060
74/01/24	11 00		0.350	0.400	0.044	0.024	0.060
74/02/13	09 30		0.360	0.500	0.025	0.010	0.015
74/03/01	17 30		0.216	0.100	0.015	0.005	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

01106E1 LS0106E1
33 06 00.0 086 27 00.0 4
YELLOWLEAF CREEK
01 MAP SHELBY CO
T/LAY LAKE 013591
ST HWY 25 BRDG 3 MI E OF WILSONVILLE
11PALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/04	14 15		0.126	0.440	0.044	0.014	0.060
73/04/07	13 00		0.074	2.700	0.120	0.024	0.045
73/05/14	18 50		0.115	0.460	0.033	0.013	0.030
73/06/13	19 15		0.092	0.420	0.005K	0.011	0.035
73/07/10	09 50		0.014	0.960	0.026	0.007	0.055
73/08/09	10 00		0.016	0.480	0.022	0.011	0.050
73/09/06	10 00		0.010K	0.490	0.011	0.005K	0.045
73/10/04	15 30		0.038	0.720	0.025	0.005K	0.050
73/11/05	18 20		0.168	0.500	0.027	0.006	0.065
73/12/05			0.092	0.300	0.020	0.008	0.020
74/01/07	18 23		0.168	0.300	0.024	0.016	0.045
74/01/24	10 30		0.160	0.100	0.032	0.012	0.040
74/02/13	09 00		0.192	0.100	0.020	0.010	0.025
74/03/01	18 00		0.232	0.550	0.020	0.005	0.061

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0106F1 LS0106F1
33 14 30.0 086 25 00.0 4
KAHATCHEE CREEK
01 MAP TALLADEGA CO
T/LAY LAKE 033591
BRDG ON RD 1 MI SW OF CHILDERSBURG
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	09 40		0.087	1.700	0.063	0.010	0.025
73/03/30	10 10		0.050	2.300	0.069	0.005K	0.015
73/05/14	09 50		0.070	0.750	0.021	0.007	0.015
73/06/12	08 45		0.088	0.730	0.115	0.008	0.015
73/07/03	09 30		0.132	0.250	0.032	0.008	0.025
73/08/07	13 00		0.074	0.310	0.019	0.021	0.050
73/09/06	15 45		0.027	0.210	0.017	0.006	0.017
73/10/05	11 00		0.039	0.300	0.021	0.005K	0.025
73/11/08	10 30		0.010K	0.850	0.018	0.011	0.025
73/12/06	11 45		0.028	0.500	0.020	0.005K	0.020
74/01/08	11 55		0.064	0.200	0.010	0.006	0.015
74/01/26	08 00		0.056	0.100K	0.012	0.008	0.008
74/02/06	11 45		0.084	0.100K	0.010	0.010	0.010
74/02/21	16 45		0.056	0.500	0.040	0.005	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010601 LS010601
33 39 00.0 086 24 30.0 4
CEDAR CREEK
01 MAP TALLADEGA CO
T/LAY LAKE 033591
CEDAR CREEK RD ABOU 1 MI N OF FAYETTEVIL
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	10	10	0.220	1.540	0.048	0.005K	0.040
73/03/30	09	45	0.189	2.520	0.154	0.012	0.060
73/05/14	10	05	0.022	1.400	0.026	0.006	0.040
73/06/12	09	10	0.010K	1.300	0.014	0.008	0.075
73/07/21	09	45	0.010K	0.440	0.006	0.006	0.045
73/08/07	10	15	0.010K	0.960	0.028	0.007	0.035
73/09/06	16	00	0.010K	0.750	0.036	0.006	0.035
73/10/05	11	20	0.010K	0.560	0.017	0.005K	0.045
73/11/08	11	30	0.140	1.800	0.044	0.012	0.095
73/12/06	11	55	0.076	0.400	0.016	0.005K	0.020
74/01/08	1[illegible]	15	0.208	0.400	0.056	0.024	0.075
74/01/25	08	10	0.288	0.450	0.020	0.005K	0.275
74/02/06	12	02	0.208	0.200	0.010	0.005	0.030
74/02/21	17	00	0.216	0.600	0.030	0.010	0.055

K VALUE KNOWN TO BE
LESS THAN INDICATED

48A

STORET RETRIEVAL DATE 76/07/22

0106MI LS0106MI
33 05 30.0 086 26 30.0 4
MECHERWOOD CREEK
01 4AP COOSA CO
T/LAY LAKE 033591
BRDG ON RD 2.5 MI NE OF BLUE SPRINGS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	10 30		0.040	0.310	0.036	0.018	0.020
73/04/05	15 00		0.063	1.980	0.075	0.009	0.020
73/05/04	16 30		0.069	2.500	0.110	0.020	0.020
73/06/09	23 00		0.032	4.400	0.017	0.011	0.045
73/07/03	10 40		0.068	0.160	0.019	0.008	0.020
73/08/07	11 30		0.048	0.180	0.013	0.012	0.030
73/09/04	09 20		0.044	0.600	0.029	0.010	0.045
73/10/04	16 00		0.035	0.195	0.021	0.005K	0.025
73/11/09	13 15		0.044	0.200	0.017	0.017	0.040
73/12/05	16 30		0.040	1.100	0.020	0.008	0.020
74/01/08	17 00		0.060	0.100	0.008	0.008	0.015
74/01/26	11 00		0.040	0.100K	0.016	0.005K	0.035
74/02/11	17 00		0.052	0.100K	0.010	0.005	0.005
74/12/26	16 30		0.048	0.100K	0.005	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010601 LS010601
33 01 00.0 086 28 00.0 4
PAINT CREEK
01 MAP COOSA CO
T/LAY LAKE 033591
BRDG ON RD 2 MI S OF MARBLE VALLEY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	11	15	0.010K	1.700	0.050	0.007	0.020
73/04/05	15	20	0.020	1.760	0.053	0.005K	0.010
73/05/09	16	30	0.023	1.760	0.091	0.014	0.020
73/06/04	22	00	0.010K	3.300	0.031	0.005K	0.015
73/07/03	10	40	0.010K	0.440	0.011	0.006	0.035
73/08/07	12	00	0.010K	0.660	0.054	0.007	0.015
73/09/04	09	00	0.010K	0.270	0.030	0.005K	0.005K
73/10/04	16	30	0.035	0.200	0.019	0.005K	0.025
73/11/09	13	35	0.010K	0.700	0.022	0.008	0.022
73/12/05	11	00	0.040	0.300	0.012	0.008	0.020
74/01/08	16	30	0.056	0.100	0.008	0.005K	0.015
74/01/26	10	00	0.088	0.100K	0.020	0.005K	0.030
74/02/11	16	00	0.052	0.100K	0.005K	0.005K	0.010
74/02/26	16	00	0.040	0.100K	0.005	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0106AA AS0106AA P000400
33 13 15.0 086 13 42.0 4
SYLACAUGA #3 (FAIRMONT)
01 TALLADEGA CO HWY
T/LAY LAKE 033591
TRIB TO TALLASSEEHATCHIE CR
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/19			13.600	4.700	2.000	10.500	13.000		
73/08/21	06	40							
CP(T)-			13.000	3.900	3.322	13.500	14.700		
73/08/21	17	40							
73/09/26	06	15							
CP(T)-			0.600	7.100	5.300	12.800	14.500		
73/09/26	17	15							
73/10/23	06	40							
CP(T)-			14.800	1.950	0.710	13.700	14.000		
73/10/23	17	40							
73/11/23	06	30							
CP(T)-			0.050	7.900	4.100	10.600	11.000		
73/11/23	17	30							
73/12/17	05	30							
CP(T)-			14.600	0.500K	0.260	9.900	11.500		
73/12/17	16	30							
74/01/24	05	30							
CP(T)-			12.000	3.300	2.080	10.000	11.500		
74/01/24	16	30							
74/02/25	08	00							
CP(T)-			8.500	2.000	0.310	5.000	5.400		
74/02/25	16	00							
74/03/22	06	30							
CP(T)-			11.200	4.350	1.950	8.175	9.290		
74/03/22	17	30							
74/04/24	05	30							
CP(T)-			1.840	12.000	3.600	11.500	12.000		
74/04/24	16	30							
74/05/21	06	30							
CP(T)-			18.000	4.600	2.100	12.500	14.500		
74/05/21	16	30							
74/06/26	06	00							
CP(T)-			14.700	1.598	0.440	11.000	12.500		
74/06/26	18	00							

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0106AH EA0106AB P000300
33 13 49.0 086 12 01.0 4
SYLACAUGA #2 (OLDFIELD)
GI TALLADEGA CO HWY
T/LAY LAKE 033591
CROOKED CREEK/TALLASSEEHATCHIE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/19	06 20								
CP(T)- 73/07/19	17 20		2.700	0.250	0.110	2.100	2.200		
73/08/21	06 40								
CP(T)- 73/08/21	17 40		10.500	0.100K	0.028	7.400	7.500		
73/09/26	06 30								
CP(T)- 73/09/26	17 30		14.200	0.810	0.770	15.800	16.500		
73/10/23	06 40								
CP(T)- 73/10/23	17 40		20.000	0.930	0.420	16.000	18.250		
73/11/23	06 30								
CP(T)- 73/11/23	17 30		10.000	0.500K	0.100	8.700	8.700		
73/12/17	05 30								
CP(T)- 73/12/17	16 30		14.000	0.500K	0.099	12.000	12.500		
74/01/24	05 30								
CP(T)- 74/01/24	16 30		3.360	0.500	0.120	1.840	2.000		
74/02/25	08 00								
CP(T)- 74/02/25	16 00		1.920	2.300	0.610	0.850	1.300		
74/03/22	06 30								
CP(T)- 74/03/22	17 30		5.800	2.000	0.790	3.775	4.375		
74/04/24	05 30								
CP(T)- 74/04/24	16 30		2.040	1.000K	0.220	1.350	1.350		
74/05/21	06 30								
CP(T)- 74/05/21	16 30		5.100	1.000K	0.250	5.100	5.700		
74/06/25	06 00								
CP(T)- 74/06/25	18 00		9.600	2.700	0.035	7.450	7.350		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0106AC TF0106AC P012200
83 10 00.0 086 16 00.0 4
SYLACAUGA #1
01 TALLADEGA CO HWY
T/LAY LAKE
SHIRTEE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/19 06 00									
CP(T)-			1.800	5.800	1.100	4.600	5.700	2.000	
73/07/19 17 00									
73/08/21 06 40									
CP(T)-			0.680	8.900	1.440	6.300	7.940	2.000	
73/08/21 17 40									
73/09/26 07 00									
CP(T)-			0.690	8.300	0.990	8.400	9.600	2.000	
73/09/26 18 00									
73/10/23 06 40									
CP(T)-			1.060	13.000	3.000	8.300	10.000	2.000	
73/10/23 17 40									
73/11/23 06 30									
CP(T)-			3.100	14.500	5.300	7.200	8.900	2.000	
73/11/23 17 30									
73/12/17 05 30									
CP(T)-			2.600	16.000	3.500	7.400	10.000	2.000	
73/12/17 16 30									
74/02/25 08 00									
CP(T)-			0.720	5.400	0.460	2.200	3.100	2.000	
74/02/25 16 00									
74/03/22 06 30									
CP(T)-			0.074	12.000	0.315	4.175	6.050	2.000	
74/03/22 17 30									
74/04/24 05 30									
CP(T)-			0.040	12.000	0.665	4.300	6.200	2.000	
74/04/24 16 30									
74/05/21 06 30									
CP(T)-			0.240	16.000	3.450	7.000	9.000	2.000	
74/05/21 16 30									
74/06/26 06 00									
CP(T)-			0.160	16.000	4.700	7.700	8.900	2.000	
74/06/26 18 00									

STORET RETRIEVAL DATE 76/07/22

01036AD ST01036AD P000219
33 16 30.0 086 21 00.0 4
BOM AIR
01 CALLADEGA CO HWY
T/LAY LAKE 033591
GRIFFEN BRANCH
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/09	08 15		0.460	1.000	0.005K	0.250	0.310		
73/05/17	10 00		0.550	10.500	0.840	1.600	2.600	0.072	0.072
73/06/11	10 00		0.360	7.600	0.490	1.500	2.400		0.072
73/08/13	09 30		0.070	10.000	2.900	3.900	6.000	0.072	0.079
73/09/10	09 00		0.052	32.300	6.400	4.600	6.100	0.072	0.072
73/10/04	10 00		0.060	7.600	0.072	1.050	2.200	0.072	0.072
73/11/05	10 45		0.210	9.000	0.072	1.320	2.950	0.072	0.072
73/12/10	08 00		0.080	10.500	0.066	1.470	2.200	0.072	0.072
74/01/14	09 00		1.400	5.600	0.040K	0.300	0.420	0.072	0.072
74/02/11	08 30							0.072	0.072
74/03/04	10 30		0.760	14.000	0.050K	1.580	2.800	0.072	0.072

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0106AF P0106AF P004000
33 17 30.0 086 22 00.0 4
CHILDERSBURG WEST
01 TALLADEGA CO HWY
T/LAY LAKE 033591
BAILEYS BRANCH
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/08/10			0.060	8.500	0.180	1.400		0.350	0.350
73/09/10	14 30		0.370	7.420	0.280	4.700	6.300	0.350	0.330
73/11/14	10 00		0.260	6.400	0.170	7.900	8.700	0.350	0.350
73/12/10	11 00		0.290	8.700	0.210	7.100	8.400	0.350	0.350
74/01/15	13 00		0.280	5.000	0.100	4.400	5.400	0.350	0.350
74/02/12	11 00		0.320	6.300	0.130	3.600	4.700	0.350	0.350
74/03/13	11 00		0.160	5.600	0.410	4.000	4.800	0.350	0.350
74/04/09	09 40		0.160	2.000	0.057	3.100	4.350	0.350	0.350
74/05/09	10 00		0.080	5.700	0.087	2.200	3.450	0.350	0.350
74/06/06	10 00		0.200	6.800	0.050K	4.300	5.250	0.350	0.350
74/07/10	11 00		0.160	16.000	0.070	3.300	5.500	0.350	0.350
74/08/06	10 30		0.200	14.000	0.450	6.100	8.000	0.350	0.350

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

01068A A501068A P001655*
33 06 00.0 086 45 00.0 4
CALERA
01 SHELBY CO HWY
T/LAY LAKE 033692
WAXAHATCHEE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/05/09	11 00		10.500	1.100	0.183	8.200	8.200	0.125	
73/07/31	08 00		0.018	1.550	0.110	8.500		0.153	0.150
73/10/02	10 30		4.500	1.200	0.075	8.500	9.000	0.111	0.117
74/01/01	10 00		7.800	0.500K	0.040K	5.700	5.800	0.117	0.110
74/02/04	11 00		9.300	1.000K	0.040K	6.200	6.600	0.112	0.130
74/03/15	09 30		20.000	1.000K	0.120	10.000	10.000	0.012	0.123
74/07/21	07 00		0.400	15.000	6.750	6.500	8.500	0.100	0.117

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/07/22

010688 P0010588 P003000
33 00 30.0 086 36 00.0 4
COLUMBIANA
01 SHELBY CO MAP
T/LAY LAKE 013591
TOWN CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/09/17	11 00		0.096	17.600	0.250	6.760	8.850	0.320	0.320
73/10/30	13 30		0.063	11.000	0.170	6.600	8.100	0.320	0.320
73/12/06	14 30		0.220	10.000	0.190	4.800	6.100	0.320	0.320
74/01/11	11 45		0.480	3.550	0.240	1.200	2.050	0.320	0.320
74/04/08	16 00		0.150	10.000	0.180	2.600	4.900	0.320	0.320
74/05/20	08 00		0.160	4.000	0.077	1.250	1.700	0.320	0.320
74/07/29	13 00		0.120	6.800	0.050K	2.800	3.800	0.320	0.320
74/08/26	11 30		0.040	16.000	0.050K	0.050K	4.100	0.320	
74/09/25	14 00		0.120	13.500	0.310	5.100	6.900		0.320
74/10/22	14 00		0.160	10.000	0.160	4.300	5.500		0.320

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0106KA A50106KA P000659
33 14 00.0 086 29 00.0 4
WILSONVILLE
01 SHELBY CO HWY
T/LAY LAKE 033591
BULLETT CREEK
11FEALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/30	13 00		2.560	1.100	0.028	1.030	2.600		
73/05/31	13 00		2.600	4.500	0.320	0.300	1.050		
73/07/05	13 00		1.050	7.750	0.420	1.920	26.300		
73/08/01	10 00		1.260	8.200	0.550	3.000	6.900	0.031	0.031
73/08/30	10 30			9.900	0.560	3.940	9.000		
73/10/01	13 30		1.600	5.000	2.300	1.800	3.300	0.031	
73/11/01	09 30		3.430	15.500	3.300	10.000	11.500	0.031	
73/12/03	13 10		2.500	8.000	0.170	2.300	4.800		0.031
74/01/31	12 30		0.680	1.500	0.160	0.440	2.700		0.037
74/04/01	13 00		0.360	1.200	0.050*	0.350	0.450		0.037
74/04/29	12 10		1.120	7.300	0.100	2.400	3.600		

* VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010RA1 L5010RA1
32 48 00.0 086 27 00.0 4
COOSA RIVER
01 MAP CHILTON CO M
U/MITCHELL LAKE (RESVR) 033521
AT MITCHELL DAM 11 MI SSE OF CLANTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	15	35	0.315	7.100	0.240	0.042	0.042
73/04/07	09	30	0.240	1.300	0.168	0.044	0.090
73/05/05	10	00	0.200		0.120	0.039	0.082
73/06/03	09	35	0.147	1.380	0.084	0.031	0.145
73/07/14	09	30	0.250	0.370	0.054	0.030	0.065
73/08/25	08	57	0.058	0.335	0.052	0.011	0.030
73/09/04	09	50	0.066	0.400	0.044	0.016	0.045
73/10/21	09	40	0.154	0.350	0.020	0.028	0.045
73/11/18	10	10	0.378	0.700	0.039	0.036	0.045
73/12/09	10	15	0.300	0.300	0.036	0.060	0.105
74/01/05	09	30	0.288	0.400	0.060	0.068	0.130
74/01/14	10	15	0.270	0.400	0.076	0.070	0.145
74/02/02	14	20	0.330	1.200	0.070	0.035	0.075
74/02/16	14	20	0.320	0.500	0.050	0.040	0.085

STORET RETRIEVAL DATE 76/07/22

0108A2 L5010BA2
32 58 00.0 086 31 00.0 4
COOSA RIVER
01 MAP CHILTON CO H
1/MITCHELL LAKE (RESVR) 033592
MIDSTREAM FROM FERRY S OF LAY DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	01	45	0.240	1.260	0.083	0.036	0.085
73/04/07	10	20	0.240	1.500	0.154	0.044	0.090
73/05/05	09	40	0.210	2.700	0.170	0.033	0.080
73/05/03	09	50	0.160	0.560	0.072	0.035	0.095
73/07/18	10	00	0.270	0.400	0.040	0.034	0.070
73/08/20	09	05	0.044	0.260	0.040	0.011	0.035
73/09/04	11	50	0.115	0.520	0.041	0.025	0.050
73/10/21	10	20	0.198	0.500	0.020	0.021	0.040
73/11/18	10	15	0.390	0.950	0.033	0.036	0.055
73/12/04	09	30	0.264	0.400	0.064	0.052	0.095
74/01/05	09	35	0.284	0.500	0.056	0.072	0.135
74/01/14	09	45	0.310	0.500	0.072	0.065	0.140
74/02/02	15	00	0.470	1.200	0.165	0.035	0.080
74/02/18	10	30	0.330	0.790	0.070	0.035	0.085

STORET RETRIEVAL DATE 76/07/22

010881 LS010881
32 49 30.0 086 30 00.0 4
CARGLE CREEK
01 MAP CHILTON CO M
T/MITCHELL LAKE (RESVR) 033592
SEC RD XING 6.5 MI E OF CLANTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00655 PHOS-TOT MG/L P
73/03/03	15	15	0.054	1.890	0.056	0.008	0.070
73/04/07	09	15	0.180	2.600	0.470	0.040	0.130
73/05/05	09	15	0.120	2.100	0.066	0.006	0.015
73/06/03	09	15	0.132	1.750	0.078	0.011	0.025
73/07/14	11	40	0.170	1.100	0.550	0.013	0.025
73/08/25	08	40	0.039	0.100K	0.012	0.006	0.010
73/09/09	12	40	0.031	0.290	0.015	0.005K	0.015
73/10/21	09	00	0.017	0.250	0.015	0.006	0.006
73/11/18	09	35	0.012	0.300	0.023	0.005K	0.005K
73/12/09	09	35	0.116	0.300	0.016	0.012	0.025
74/01/05	09	30	0.312	0.100	0.032	0.016	0.030
74/01/19	09	35	0.320	0.200	0.040	0.015	0.040
74/02/02	13	40	0.184	0.100	0.035	0.010	0.020
74/02/15	13	40	1.430	0.100	0.055	0.020	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

0108C1 LS0108C1
32 53 00.0 086 32 00.0 4
WALNUT CREEK
01 MAP CHILTON CO H
T/MITCHELL LAKE (RESVR) 033592
SEC RD XING 6 MI NE OF CLANTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	02	20	0.360	3.500	0.310	2.500	2.750
73/04/07	11	00	0.320	1.800	0.470	0.125	0.345
73/05/05	09	10	2.020	7.500	0.520	0.154	0.270
73/06/03	09	10	0.460	5.200	0.815	3.000	3.300
73/07/14	09	25	0.300	0.780	0.520	2.800	
73/08/25	08	20	2.060	0.800	0.315	4.600	4.600
73/09/09	10	00	0.680	3.780	3.750	3.100	3.100
73/10/21	11	45	0.290	0.600	0.042	0.019	0.075
73/11/18	09	45	0.920	1.950	1.160	1.800	1.800
73/12/09	09	00	0.580	1.400	0.830	1.100	1.300
74/01/05	09	05	0.450	1.000	0.168	1.440	1.700
74/01/19	09	10	0.450	0.400	0.092	1.450	1.880
74/02/02	13	45	0.400	1.100	0.260	0.660	0.760
74/02/16	09	30	0.650	1.000	0.220	0.640	0.800

STORET RETRIEVAL DATE 76/07/22

010801 LS010801
32 57 30.0 086 32 00.0 4
YELLOWLEAF CREEK
01 MAP CHILTON CO M
1/MITCHELL LAKE (RESVR) 033592
SEC RD XING 1 MI SW OF LAY DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	01 50		0.088	2.600	0.064	0.014	0.045
73/04/07	09 45		0.132	2.500	0.460	0.022	0.135
73/05/05	10 15		0.132	1.400	0.096	0.010	0.030
73/06/03	10 10		0.170	2.510	0.088	0.019	0.025
73/07/16	10 25		0.165	0.340	0.036	0.034	0.035
73/08/20	09 25		0.092	0.230	0.021	0.025	0.030
73/09/04	11 15		0.044	0.420	0.048	0.045	0.04[illegible]
73/10/21	10 45		0.042	0.450	0.017	0.009	0.015
73/11/18	10 30		0.017	0.400	0.016	0.005	0.015
73/12/09	09 45		0.072	0.200	0.032		0.017
74/01/05	09 55		0.108	0.300	0.016	0.008	0.030
74/01/19	10 00		0.224	0.700	0.032	0.015	0.035
74/02/02	15 55		0.168	0.800	0.100	0.015	0.015
74/02/15	11 05		0.264	0.400	0.030	0.015	0.020

STORET RETRIEVAL DATE 76/07/22

010AEI LS010AEI
32 55 30.0 086 22 00.0 4
WEOGUFKA CREEK
01 MAP COOSA CO MWY
T/4ITCHELL LAKE (RESVR) 033591
SEC RD XING .75 MI NW OF MILLWOOD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	10 05		0.010K	0.690	0.039	0.006	0.020
73/04/07	10 40		0.092	1.800	0.410	0.016	0.110
73/05/05	11 00		0.046	1.260	0.072	0.005K	0.025
73/06/03	10 30		0.034	0.190	0.018	0.011	0.025
73/07/14			0.032	1.400	0.032	0.007	0.015
73/08/25	09 40		0.012	0.420	0.016	0.015	0.020
73/09/04	11 00		0.011	0.500	0.026	0.013	0.020
73/10/21	10 40		0.010K	0.500	0.013	0.005K	0.005K
73/11/18	11 50		0.010K	0.250	0.012	0.008	0.015
73/12/04	11 20		0.040	0.350	0.008	0.012	0.017
74/01/05	11 10		0.208	0.300	0.016	0.010	0.035
74/01/14	11 10		0.112	1.200	0.300	0.010	0.040
74/02/02	15 30		0.064	0.800	0.050	0.010	0.025
74/02/14	15 25		0.108	0.200	0.020	0.010	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/07/22

01084F1 LS0108F1
32 51 00.0 086 20 30.0 4
HATCHETT CREEK
01 MAP COOSA CO HWY
T/MITCHELL LAKE 033591
SEC RD XING 1.75 MI N KELLYS CROSSROADS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/03	09 30		0.022	1.400	0.056	0.005K	0.020
73/04/07	10 00		0.050	3.100	0.535	0.012	0.110
73/05/05	10 20		0.033	2.950	0.320	0.005K	0.030
73/06/03	10 00		0.021	0.130	0.008	0.009	0.015
73/07/14	10 00		0.021	0.100K	0.019	0.009	0.020
73/08/25	09 20		0.010K	0.100K	0.007	0.008	0.015
73/09/04	10 20		0.010K	0.230	0.007	0.016	0.026
73/10/21	10 00		0.010K	0.300	0.013	0.005K	0.005K
73/11/18	10 40		0.010K	0.400	0.021	0.012	0.015
73/12/04	10 50		0.012	0.300	0.012	0.020	0.025
74/01/05	10 50		0.052	0.400	0.032	0.012	0.030
74/01/19	10 50		0.068	0.200	0.028	0.010	0.035
74/02/02	10 55		0.032	0.200	0.017	0.010	0.030
74/02/15	10 55		0.052	0.300	0.015	0.010	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/07/22

010ACA TF010ACA P004500
32 51 10.0 086 36 20.0 4
CLANTON
01 CHILTON CO HWY
T/MITCHELL RESERVOIR 033592
WALNUT CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/25	11 00								
CRITIC			0.795	1.840	0.785	1.050	1.500	1.160	1.300
73/06/25	15 00								
73/05/28	11 00								
CRITIC			3.965	2.400	1.700	1.100	1.550	1.300	1.260
73/05/28	15 00								
73/06/25	11 00								
CRITIC			0.134	18.000	8.300	6.200	8.500	1.170	1.160
73/06/25	15 00								
73/07/24	11 00								
CRITIC			1.980	21.000	11.000	6.200	8.000	0.628	0.695
73/07/24	15 00								
73/08/27	11 00								
CRITIC				25.000		12.400	15.500	0.404	0.454
73/08/27	15 00								
73/09/27	11 00								
CRITIC			0.170	24.000	15.900	11.600	15.400	0.249	0.360
73/09/27	15 00								
73/10/30	11 00								
CRITIC			5.000	24.000	9.900	15.400	19.500	0.346	0.530
73/10/30	15 00								
73/11/27	11 00								
CRITIC			3.700	12.000	5.300	10.200	10.500	0.487	0.416
73/11/27	15 00								
73/12/31	11 00								
CRITIC			2.520	8.100	1.760	2.400	3.000	0.729	0.558
73/12/31	15 00								
74/01/29	11 00								
CRITIC			1.560	6.000	2.080	2.500	3.100	0.702	0.730
74/01/29	15 00								
74/02/26	11 00								
CRITIC			2.240	3.650	1.930	2.800	3.250	0.636	0.634
74/02/26	15 00								
74/03/31	11 00								
CRITIC			1.240	4.000	2.800	3.750	4.400	0.637	0.635
74/03/31	15 00								

STORET RETRIEVAL DATE 76/07/22

010ACA TF010ACA P004500
32 51 10.0 086 36 20.0 4
CLANTON
01 CHILTON CO HWY
T/MITCHELL RESERVOIR 033592
WALNUT CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/04/30	11 00								
CHILD-			3.200	8.300	3.100	4.900	5.700	0.632	0.633
74/04/30	16 00								

APPENDIX E

PARAMETRIC RANKINGS OF LAKES
SAMPLED BY NES IN 1974
STATE OF ALABAMA

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
0101	HANKHEAD LAKE	0.024	0.770	452.667	4.017	14.900	0.007
0103	GANTT RESERVOIR	0.029	0.300	465.778	2.144	14.000	0.008
0104	GUNTERSVILLE RESERVOIR	0.044	0.480	461.111	8.567	12.200	0.014
0105	HOLT LOCK AND DAM	0.018	0.835	449.417	2.183	13.600	0.005
0106	LAY LAKE	0.075	0.390	470.778	7.656	13.000	0.032
0107	MARTIN LAKE	0.017	0.170	435.250	6.407	15.000	0.004
0108	MITCHELL LAKE	0.053	0.290	466.000	6.211	12.400	0.022
0109	PICKWICK LAKE	0.056	0.535	455.000	2.450	11.900	0.035
0112	WEISS RESERVOIR	0.092	0.260	478.385	11.261	14.900	0.034
0114	WILSON LAKE	0.053	0.460	447.714	7.400	10.200	0.022
0115	LAKE PURDY	0.049	0.170	437.889	12.711	15.000	0.014

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
0101	HANKHEAD LAKE	75 (7)	10 (1)	60 (6)	70 (7)	25 (2)	80 (8)	320
0103	GANTT RESERVOIR	75 (7)	60 (6)	30 (3)	100 (10)	40 (4)	70 (7)	375
0104	GUNTERSVILLE RESERVOIR	60 (6)	30 (3)	40 (4)	20 (2)	80 (8)	55 (5)	285
0105	HOLT LOCK AND DAM	90 (9)	0 (0)	70 (7)	90 (9)	50 (5)	90 (9)	390
0106	LAY LAKE	10 (1)	50 (5)	10 (1)	40 (4)	60 (6)	20 (2)	190
0107	MARTIN LAKE	100 (10)	95 (9)	100 (10)	50 (5)	5 (0)	100 (10)	450
0108	MITCHELL LAKE	40 (4)	70 (7)	20 (2)	60 (6)	70 (7)	35 (3)	295
0109	PICKWICK LAKE	20 (2)	20 (2)	50 (5)	80 (8)	90 (9)	0 (0)	260
0112	WEISS RESERVOIR	0 (0)	80 (8)	0 (0)	10 (1)	25 (2)	10 (1)	125
0114	WILSON LAKE	30 (3)	40 (4)	80 (8)	30 (3)	100 (10)	35 (3)	315
0115	LAKE POWELL	50 (5)	95 (9)	90 (9)	0 (0)	5 (0)	55 (5)	295

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	0107	MARTIN LAKE	455
2	0105	HOLT LOCK AND DAM	390
3	0103	GANTT RESERVOIR	375
4	0101	BANKHEAD LAKE	320
5	0114	WILSON LAKE	315
6	0115	LAKE PURDY	295
7	0108	MITCHELL LAKE	295
8	0104	GUNTERSVILLE RESERVOIR	285
9	0109	PICKWICK LAKE	260
10	0106	LAY LAKE	190
11	0112	WEISS RESERVOIR	125